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**Steel plates for pressure vessels for
intermediate temperature service**

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Foreword

This Japanese Industrial Standard has been revised by the Minister of Economy, Trade and Industry based on the provision of Article 14, paragraph (1) of the Industrial Standardization Act applied mutatis mutandis pursuant to the provision of Article 16 of the said Act in response to a proposal for revision of Japanese Industrial Standard with a draft being attached, submitted by The Japan Iron and Steel Federation (JISF), an accredited standards development organization. This edition replaces the previous edition (**JIS G 3115** : 2016), which has been technically revised.

However, **JIS G 3115** : 2016 may be applied in the **JIS** mark certification based on the relevant provisions of Article 30, paragraph (1), etc. of the Industrial Standardization Act until 21 March 2023.

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Steel plates for pressure vessels for intermediate temperature service

Introduction

This Japanese Industrial Standard has been prepared based on **ISO 9328-1** : 2018, Edition 4, **ISO 9328-3** : 2018, Edition 4, **ISO 9328-5** : 2018, Edition 4 and **ISO 9328-6** : 2018, Edition 3 with some modifications of the technical contents.

The vertical lines on both sides and dotted underlines indicate changes from the corresponding International Standard. A list of modifications with the explanations is given in Annex JA.

1 Scope

This Standard specifies requirements for hot rolled steel plates (hereafter referred to as steel plates) with improved weldability, to be used for pressure vessels, equipment for high pressure service (excluding those to be used for high and low temperature services).

NOTE The International Standards corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 9328-1 : 2018 *Steel flat products for pressure purposes — Technical delivery conditions — Part 1 : General requirements*

ISO 9328-3 : 2018 *Steel flat products for pressure purposes — Technical delivery conditions — Part 3 : Weldable fine grain steels, normalized*

ISO 9328-5 : 2018 *Steel flat products for pressure purposes — Technical delivery conditions — Part 5 : Weldable fine grain steels, thermomechanically rolled*

ISO 9328-6 : 2018 *Steel flat products for pressure purposes — Technical delivery conditions — Part 6 : Weldable fine grain steels, quenched and tempered (overall evaluation : MOD)*

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

2 Normative references

Part or all of the provisions of the following standards, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS G 0201 *Glossary of terms used in iron and steel (Heat treatment)*

JIS G 0202 *Glossary of terms used in iron and steel (Testing)*

JIS G 0203 *Glossary of terms used in iron and steel (Products and quality)*

JIS G 0320 *Standard test method for heat analysis of steel products*

JIS G 0404 *Steel and steel products — General technical delivery requirements*

JIS G 0415 *Steel and steel products — Inspection documents*

JIS G 3193 *Dimensions, shape, mass and permissible variations of hot rolled steel plates, sheets and strips*

JIS Z 2241 *Metallic materials — Tensile testing — Method of test at room temperature*

JIS Z 2242 *Method for Charpy pendulum impact test of metallic materials*

JIS Z 2248 *Metallic materials — Bend test*

3 Terms and definitions

For the purpose of this Standard, the following terms and definitions, and those given in **JIS G 0201**, **JIS G 0202** and **JIS G 0203** apply.

3.1

quenching

operation of rapid cooling of steel products by water

Note 1 to entry Quenching also includes direct quenching.

3.2

as-rolled

condition of steel which is not thermomechanically processed or heat-treated (e.g. normalizing, and quenching and tempering)

4 Symbol of grade and applicable thickness

The steel plates are classified into six grades, and the symbols of grades and applicable thicknesses shall be as given in Table 1.

Table 1 Symbol of grade and applicable thickness

Unit: mm	
Symbol of grade	Applicable thickness
SPV235	6 or over up to and incl. 200
SPV315	6 or over up to and incl. 150
SPV355	
SPV410	
SPV450	
SPV490	

5 Manufacturing method and heat treatment

5.1 Manufacturing method

The steel plates shall be manufactured from killed steels.

5.2 Heat treatment of steel plates

The heat treatment of steel plates shall be as given in Table 2.

Table 2 Heat treatment of steel plates

Symbol of grade	Heat treatment of steel plate ^{a)}
SPV235	As-rolled. Normalized as necessary.
SPV315 SPV355	As-rolled. Normalized as necessary. Thermomechanically processed or quenched and tempered upon agreement between the purchaser and the manufacturer.
SPV410	Thermomechanically processed. Normalized or quenched and tempered upon agreement between the purchaser and the manufacturer, in place of thermomechanical control process. The maximum thickness shall be 100 mm when steel plates are thermomechanically processed.
SPV450 SPV490	Quenched and tempered. Normalized upon agreement between the purchaser and the manufacturer.
Note ^{a)}	When the purchaser is to normalize or quench and temper steel plates upon agreement, the manufacturer may apply heat treatment only to test pieces and deliver as-rolled steel plates.

5.3 Specification of heat treatment

The specification of heat treatment shall be as follows.

- The purchaser shall specify the type of heat treatment on steel plates to be performed by the manufacturer and, if necessary, the conditions and number of heat treatments on test pieces.
- When performing the heat treatment on steel plates according to Note ^{a)} to Table 2, the purchaser shall inform the manufacturer of that effect and indicate the conditions of the heat treatment on test pieces.

5.4 Heat treatment of test pieces

The specified heat treatment shall be performed on the sample taken from a steel plate and test pieces shall be taken from the heat-treated sample.

5.5 Symbol of heat treatment

The symbol of heat treatment on steel plates and test pieces shall be suffixed as follows to the symbol of grade given in Table 1.

- | | |
|--|-----|
| a) Thermomechanical control process on steel plate | TMC |
| b) Normalizing on steel plate by agreement | N |
| c) Quenching and tempering on steel plate | Q |